UNITED STATES PATENT AND TRADEMARK OFFICE

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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/776,909	02/11/2004	Louis R. Degenaro	YOR919990064US2 (8728-258	3057

			EXAMINER
46069	7590	11/18/2005	CHOI, WOO H

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ART UNIT	PAPER NUMBER
2189	

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Please find below and/or attached an Office communication concerning this application or proceeding.

	Application No.	Applicant(s)
Office Action Summary	10/776,909	DEGENARO ET AL.
	Examiner	Art Unit
	Woo H. Choi	2189

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
  Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *14 September 2005*.

2a)☒ This action is **FINAL**.   2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-51* is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-51* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a)☐ All   b)☐ Some * c)☐ None of:

      1.☐ Certified copies of the priority documents have been received.

      2.☐ Certified copies of the priority documents have been received in Application No. _____.

      3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1)☐ Notice of References Cited (PTO-892)

2)☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3)☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
    Paper No(s)/Mail Date _____.

4)☐ Interview Summary (PTO-413)
    Paper No(s)/Mail Date. _____.

5)☐ Notice of Informal Patent Application (PTO-152)

6)☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 101

1.   35 U.S.C. 101 reads as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

2.   Claims 1 – 3, 5, 8 – 11, 14, 42 and 46 are rejected under 35 U.S.C. 101 because the

claimed invention is directed to non-statutory subject matter. The language of the claim raises a

question as to whether the claims is directed merely to an abstract idea that is not tied to a

technological art, environment or machine which would result in a practical application

producing a concrete, useful, and tangible result to form the basis of statutory subject matter

under 35 U.S.C. 101. Even when automated, the claims seem to be directed to a method of

planning/preparing with no practical application of the plan. This still amounts to a machined

manipulated abstract idea, which is considered non-statutory.

Double Patenting

3.   The nonstatutory double patenting rejection is based on a judicially created doctrine
grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or
improper timewise extension of the "right to exclude" granted by a patent and to prevent possible
harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed.
Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686
F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA
1970);and, *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).
      A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to
overcome an actual or provisional rejection based on a nonstatutory double patenting ground
provided the conflicting application or patent is shown to be commonly owned with this
application. See 37 CFR 1.130(b).
      Effective January 1, 1994, a registered attorney or agent of record may sign a terminal
disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37
CFR 3.73(b).

4.   Claims 1 – 48 are rejected under the judicially created doctrine of double patenting over

claims 1 - 37 of U. S. Patent No. 6,725,333 since the claims, if allowed, would improperly

extend the "right to exclude" already granted in the patent.

The subject matter claimed in the instant application is fully disclosed in the patent and is

covered by the patent since the patent and the application are claiming common subject matter,

as follows: Independent claims 1, 18, and 35 are anticipated by patented claims 1, 17, and 33.

Dependent claims are anticipated by either the independent or the dependent claims of the patent.

Furthermore, there is no apparent reason why applicant was prevented from presenting

claims corresponding to those of the instant application during prosecution of the application

which matured into a patent. See *In re Schneller*, 397 F.2d 350, 158 USPQ 210 (CCPA 1968).

See also MPEP § 804.

As to the newly added limitations, they are implicit in the patented claims.

Claim Rejections - 35 USC § 112

5.   The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making
> and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it
> pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode
> contemplated by the inventor of carrying out his invention.

6.   Claims 42 – 44, 46 – 48 are rejected under 35 U.S.C. 112, first paragraph, as failing to

comply with the written description requirement. The claim(s) contains subject matter which

was not described in the specification in such a way as to reasonably convey to one skilled in the

relevant art that the inventor(s), at the time the application was filed, had possession of the

claimed invention.

7.   With respect to claims 42 and 46, according to the specification the probability of a value

of a cachable entity changing is based on the probability that a statement will execute, not the

other way around as claimed (see specification page 36, lines 14 – 23).

8.   With respect to claims 43, 44, 47 and 48, caching, updating and invalidating are to be

performed depending on the likelihood of a value of a chachable entity changing exceeding or

not exceeding a threshold, as opposed to the probability of a statement execution exceeding or

not exceeding a threshold (see specification page 37, lines 1 – 15).

Claim Rejections - 35 USC § 102

9.   The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the

basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

10.   Claims 1, 5, 10, 18, 22, 27, 35, 39, 40, 41 and 45 are rejected under 35 U.S.C. 102(b) as

being anticipated by Nakanishi *et al.* (US Patent No. 5,940,857, hereinafter "Nakanishi").

Nakanishi discloses an automated method for managing a plurality of cachable entities, comprising the steps of:

analyzing program code to determine if there is at least one statement which can affect a desirability of performing at least one cache transaction, if the at least one statement is executed (abstract, col. 4, lines 22 – 44, an instruction is analyzed to determine whether it is desirable to cache the instructions in the next block);

augmenting the program code with additional code to assist in determining the desirability of performing the at least one cache transaction,

determining a probability that the at least one statement will execute (col. 27, lines 7 – 14, branch destination block with high possibility of being read out from the main memory, i.e., high probability of execution, is determined and indicated with a branch indication bit added to the branch instruction);

determining the desirability of performing the at least one cache transaction based on a probability that the at least one statement will execute (see above, see also col. 6, lines 43 – 50) .

11.   Claims 1, 2, 4 – 6, 8, 18, 19, 21, 23, 25, 35, 36, 38 – 41, and 45 are rejected under 35 U.S.C. 102(b) as being anticipated by Dubey (US Patent No. 5,774,685).

12.   With respect to claims 1, 41, 4, 5, 6, 8, 18, 45, 21, 23, 25, 35, 38, 39, 40, 41, and 45, Dubey discloses a system for managing a plurality of cachable entities, comprising:

a program analyzer to analyze program code and determine if there is at least one

statement which may affect a desirability of performing at least one cache transaction, if the at

least one statement is executed (col. 3, lines 58 – col. 4, line 4);

the program analyzer determining a probability that the at least one statement will

execute (abstract, speculative prefetches associated with conditional braches by its very nature is

a determination that it is probable that a particular branch will be taken) and determining the

desirability of performing the at least one cache transaction based on a probability that the at

least one statement will execute (col. 4, lines 31 – 44, the compiler determines the desirability of

prefetching data based on a speculation that the prefetched data will actually be needed, i.e.

based on the probability or likelihood that the branch that requires the data will be taken, and

inserts a STOUCH instruction a prefetch point) determines; and

a cache manager for performing the at least one cache transaction if it is determined to be

desirable (col. 2, lines 21 – 27, instructions identified by the STOUCH instruction, i.e.,

determined to be desirable, are fetched in the instruction cache).

13.   With respect to claims 2, 19 and 36, the desirability of performing the at least one cache

transaction is based on one of a frequency of access of at least one cachable entity (col. 13, lines

19 – 25, the cache transaction involves caching the replacing the old cached data with the

prefetched data, the replacement strategy is based on the least recently used algorithm, i.e. least

frequently used), a size of at least one cachable entity, a time to one of fetch and materialize at

least one cachable entity, a lifetime of at least one cachable entity (LRU data is also the oldest

data in the cache), and a combination thereof.

14.   Claims 1 – 8, 10, 14 – 25, 27, 31 – 48 are rejected under 35 U.S.C. 102(b) as being

anticipated by Cytron *et al.* (Automatic Management of Programmable Caches, Proceedings of

the 1988 International Conference on Parallel Processing, 1988, pp. 75 – 84).

15.   With respect to claims 1, 41, 4, 5, 6, 8 18, 45, 21, 23, 25, 35, 38, 39, 40, 41 and 45,

Cytron discloses a system for managing a plurality of cachable entities, comprising:

        a program analyzer (page 228, right column, second paragraph) to analyze program code

and determine if there is at least one statement which may affect a desirability of performing at

least one cache transaction, if the at least one statement is executed (page 231, 2.0 Algorithms,

the algorithm analyzes a program to determine cacheability of variables, see page 230, left hand

column, 1.1 Software-Controlled Caches for definition of cacheability or degree of desirability of

caching, see also page 232, 2.2 Posting Values to Global Memory, Cyclon discloses a program

code sequence that should cause, i.e. highly desirable, a posting of a cached value, i.e. cache

transaction);

        the program analyzer determining a probability that the at least one statement will

execute (1.2 Execution model, the program analyzer of Cytron's disclosure analyzes DO loops to

achieve parallelism, statements in a DO loop are always executed, i.e., probability of execution is

determined to be 1, see also 2.1, Processor-Crossing dependencies, the analyzer also determines

a probability that a statement will execute in different processors) and the desirability of

performing the at least one cache transaction based on a probability that the at least one

statement will execute (figure 4, the probability of executing a Write(P_i,X) -> Read(P_j,X) pattern

in a DO loop shown in figure 4 is 1, and the analyzer determines the desirability by augmenting

the code with a POST operation code); and

a cache manager for performing the at least one cache transaction if it is determined to be

desirable (this is accomplished when the augmented program in figure 4 is executed).

16.   With respect to claims 2, 19 and 36, the desirability of performing the at least one cache

transaction is based on one of a frequency of access of at least one cachable entity, a size of at

least one cachable entity, a time to one of fetch and materialize at least one cachable entity, a

lifetime of at least one cachable entity (cacheability is determined based on an expected lifetime,

for example, expected lifetime for a non-cacheable entity is zero and expected lifetime for a

cacheable entity is greater than a temporary cacheable entity), and a combination thereof.

17.   With respect to claim 3, 20, and 37, wherein the at least one statement is a statement that

modifies a value of at least one cachable entity (a write statement modifies a value the variable

being written), and wherein the desirability is based on an expected lifetime of the at least one

cachable entity (see the rejection of claim 2 above).

18.   With respect to claims 7 and 21, at least one of the step of invalidating the at least one

cachable entity stored in the cache and the step of updating the at least one cachable entity stored

in the cache comprise the step of performing data update propagation (DUP) (figure 4, updated

X(j) is propagated to the next iteration, see also figure 3, a cached value from one processor is

updated and propagated to another processor).

19.   With respect to claims 10 and 27, the cachable entities include query results (a processor

querying the cache for a data item reads on this claim).

20.   With respect to claims 14, 15, 31 and 32, the at least one statement is a type that one of

creates at least one cachable entity, deletes at least one cachable entity, and modifies a value of at

least one cachable entity (figure 4), wherein the analyzing step comprises the steps of:

        generating an invalidation key format in accordance with the type of the at least one

statement (figure 5); and

        augmenting the program code with additional code for calculating an invalidation key in

accordance with the generated invalidation key format (figure 5).

21.   With respect to claims 16 and 33, wherein the step of invalidating at least one cachable

entity comprises one of purging the cachable entity from the cache, purging the cachable entity

from the cache and repopulating the cache, and updating the cache (page 232, 2.3 Invalidating

Cache, see also page 233, 2.4 Flush).

22.   With respect to claims 17 and 34, the step of performing at least one cache transaction

comprises the step of initializing a cache (Cytron disclose a software controlled cache which

must be initialized and populated to function properly, initial entries of values meet the

limitations of this claim).

23.   With respect to claims 42 and 46, Cytron discloses determining said probability based on

likelihood of a value of a cachable entity changing (a write statement changes the value of X, see

figure 4).

24.   With respect to claims 43, 44, 47, and 48, the values are cached, posted and invalidated

regardless of the threshold value, therefore, they are cached and invalidated if the probability is

less than a threshold and they are cached and invalidated if the probability is greater than a

threshold. See page 232.

Claim Rejections - 35 USC § 103

25.   The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in
> section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are
> such that the subject matter as a whole would have been obvious at the time the invention was made to a person
> having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the
> manner in which the invention was made.

26.   Claims 9 and 26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Cytron in

view of Levine *et al.* (US Patent No. 6,073,129).

Cytron discloses all of the limitations of the parent claims as discussed above. However,

Cytron does not specifically disclose the use of SQL code and that the code includes a SET

statement. On the other hand Levine spefically discloses RDMS system that uses SQL codes

including a SET statement (col. 29, line 57).

It would have been obvious to one of ordinary skill in the art, having the teachings of

Cytron and Levine before him at the time the invention was made, to use the RDMS teachings of

the computer system with caching of Levine in the computer system with caching of Cytron, in

order to in apply Cytron's automatic management of programmable caching method in a

practical and widely used real life application such as the one disclosed by Levine.

Response to Amendment

27.   Claims 43, 44, 47 and 48 have been amended to overcome rejections under 35 USC 112,

second paragraph. Corresponding rejections are withdrawn.

Response to Arguments

28.   With respect to Applicant's argument regarding rejections under 35 USC 101, the

claimed method of "managing" does not claim any step of managing cacheable entities. The

claimed steps merely consist of analyzing and determining or calculating some quantities without

actually using any of the results of such analyses for managing cacheable entities. In fact, the

claimed method does not even require any cacheable entity that the method is supposed to

manage. Analyses and calculations may be necessary for certain methods of managing

cacheable entities, but they do not constitute acts of management by themselves. Unless these

quantities are actually used to perform a useful, practical and concrete step, such as, making a

caching decision based on the calculated quantities, the claimed method of "managing cacheable

entities" amounts to an unrealized automated manipulation of an abstract idea, that may or may not be used for management of cacheable entities, "as baldly stated in the Office Action."

29.   With respect to Applicant's arguments regarding rejections 49 – 51, upon review of the section of the specification indicated by Applicant, page 38, lines 1 – 22, the Examiner agrees that the limitation "desirability" as used in the instant Application refers to something that is quantifiable and that can be calculated. Therefore, rejections of claims 49 – 51 under 35 USC 112 are withdrawn.

30.   With respect to claims 42 and 46, notwithstanding Applicant's bewilderment and bare assertion that the cited section actually supports the claim language, understanding that the claimed limitation is not supported is a matter of simple logic. The premise "if A then B" does not support the conclusion "B therefore A". Although the situation here is not an exact analogue, it is very similar. That B depends on A does not mean that A depends on B. The likelihood of a cacheable entity changing depends on the probability of execution of a statement that affects the entity. On the other hand, the probability of the statement executing depends on the structure of the program being analyzed, but not on the likelihood of the entity changing as claimed.

31.   With respect to claims 43, 44, 47 and 48, review of page 36, lines 9 – 23, as Applicant urged, has not revealed any disclosure regarding caching, updating and invalidating. Moreover, Applicant has not made any argument specifically pointing out any supposed error to support the

traversal. General allegations are not sufficient to overcome rejections. Therefore, Applicant

has failed to overcome the rejections.

32.   Applicant's arguments regarding rejections based on the Nakanishi reference have been

fully considered, but they are not persuasive. While Applicant alleges that Nakanishi does not

disclose or even remotely suggest the disputed claim limitation, Applicant does not explain why

this is so. Applicant's arguments fail to comply with 37 CFR 1.111(b) because they amount to a

general allegation that the claims define a patentable invention without specifically pointing out

how the language of the claims patentably distinguishes them from the references. Moreover,

contrary to Applicant's assertion, Nakanishi does teach the limitation "analyzing program code

to determine if there is at least one statement which can affect a desirability of performing at

least one cache transaction, if the at least one statement is executed" as clearly stated and

explained in the rejection above.

33.   Applicant's arguments regarding rejections based on the Cytron reference have been fully

considered, but they are not persuasive. As fully explained in the statement of rejection above,

probability of execution of a statement in a do-loop is 1 if the do-loop is executed. Based on this

probability of 1 (or certainty), the analyzer inserts POST (B(j)) statement to cache variable B(j)

in figure 4 because it was determined to be desirable to cache the variable. Variable X(j) in the

same loop is not posted, presumably because it was not deemed to be desirable.

34.   Applicant's arguments regarding rejections based on the Dubey reference have been fully

considered, but they are not persuasive. The Examiner is not certain why Applicant does not

believe that claimed limitations are not taught by Dubey's disclosure as the arguments do not

seem to contain any explanation as to how the language of the claims patentably distinguishes

them from Dubey's disclosure of prefetching. Dubey's teaching of the claimed limitations are

clearly stated and explained in the rejections above. However, Applicant chose to not address

detailed and specific statements supporting the rejection. Instead, Applicant resorted to what

amounts to a general allegation. Therefore, Applicant has failed to overcome the prima facie

case presented above.

Conclusion

35.   Any inquiry concerning this communication or earlier communications from the

examiner should be directed to Woo H. Choi whose telephone number is (571) 272-4179. The

examiner can normally be reached on M-F, 9:00-5:30.

    If attempts to reach the examiner by telephone are unsuccessful, the examiner's

supervisor, Matt Kim can be reached on (571) 272-4182. The fax phone number for the

organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent

Application Information Retrieval (PAIR) system. Status information for published applications

may be obtained from either Private PAIR or Public PAIR. Status information for unpublished

applications is available through Private PAIR only. For more information about the PAIR

system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR

system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

whc
November 4, 2005

BEHZAD JAMES PEIKARI
PRIMARY EXAMINER